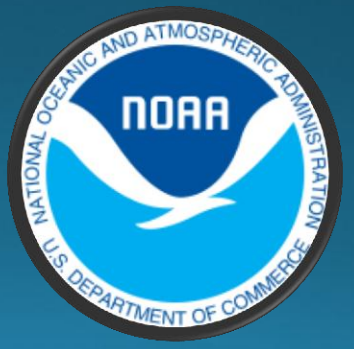
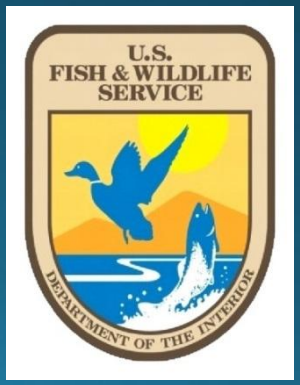
Caribbean Southeast Area Monitoring and Assessment Program (SEAMAP-C)

Aida Rosario
2014

Participating Agencies

- Puerto Rico Sea Grant Program
- Puerto Rico Department of Natural and Environmental Resources
- Virgin Islands Division of Fish and Wildlife
- Caribbean Fishery Management Council
- U.S. Fish and Wildlife Service
- National Marine Fisheries Service





SURVEYS

- Reef Fish Survey – USVI & PR
- Queen Conch Survey – USVI & PR
- Lobster Survey – USVI & PR
- Parrotfish Survey – USVI
- Yellowtail Snapper Survey – USVI & PR
- Lane Snapper Survey – PR
- Deep Water Snappers – USVI & PR
- Hydroacoustic – USVI & PR

SAMPLING METHODS

- Standard information (date, latitude/longitude, etc.)
- Hook and line reef fish bottom fishing & yellowtail snapper
- Visual census (scooters) queen conch
- Artificial habitat (casitas and larvae collectors)
- Bottom longline for lane snappers
- Dataloggers (hydroacoustic)

USES OF SEAMAP DATA

- Determining year to year trends in abundance
- Identifying essential fish habitat
- Obtaining basic biological data (reproduction patterns)
- Spawning aggregations
- Age and growth
- Stock assessment by SEDAR

Queen Conch Survey Methodology

- Stratified randomized stations based on expected abundances as determined by historical fishing patterns.
- A minimum of 100 stations
- Visual census by a pair of divers using scooters
- Maximum survey time will be 45 minutes
- Scooter are approximately one meter above the substrate so that path width remained constant at 4 meters within the transect
- Depth, habitat type, start and end time, time at each habitat change arerecorded

Queen Conch Survey

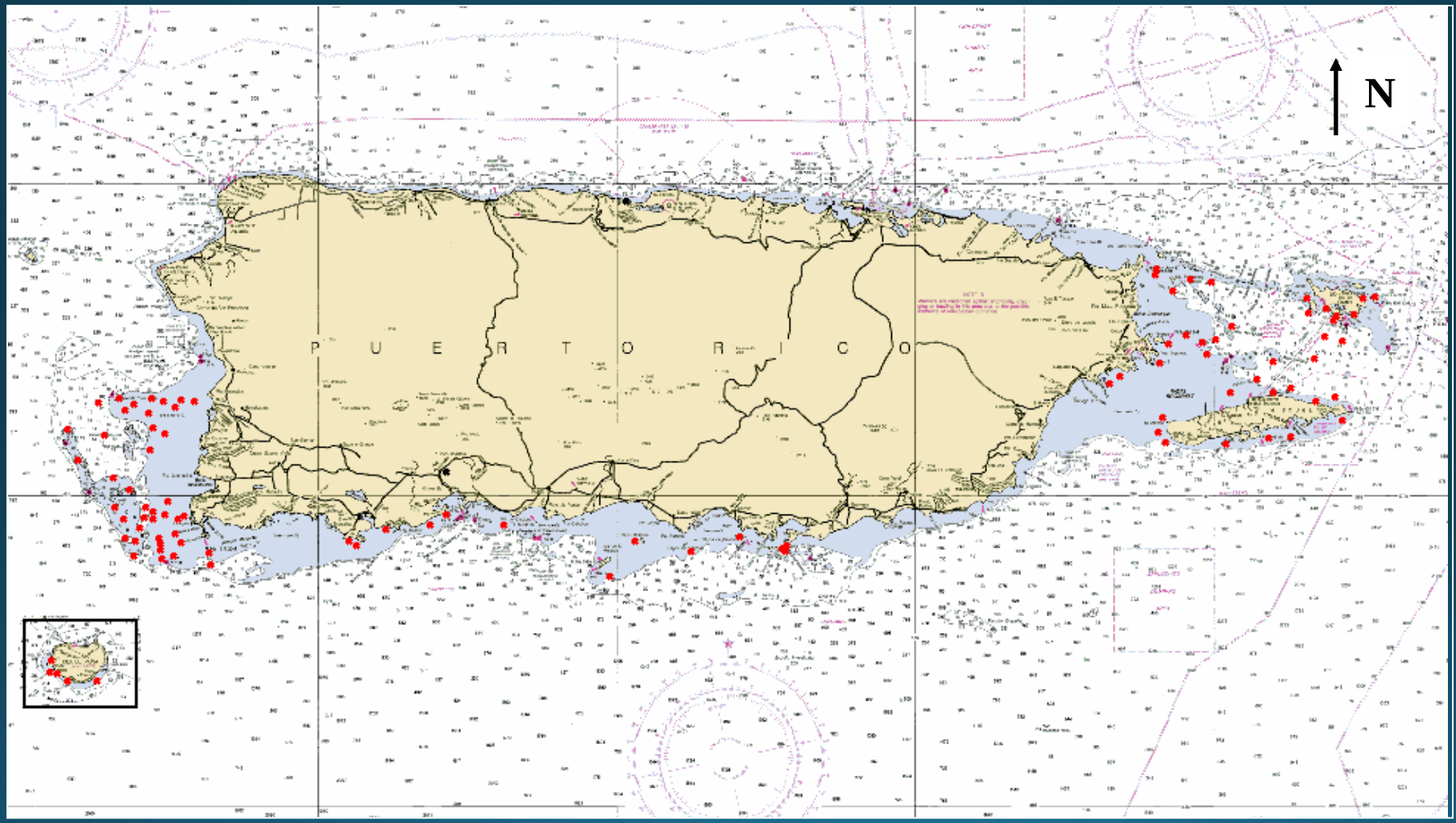
Determine queen conch (*Strombus gigas*) abundance, distribution and other parameters.

Diver with "scooter"

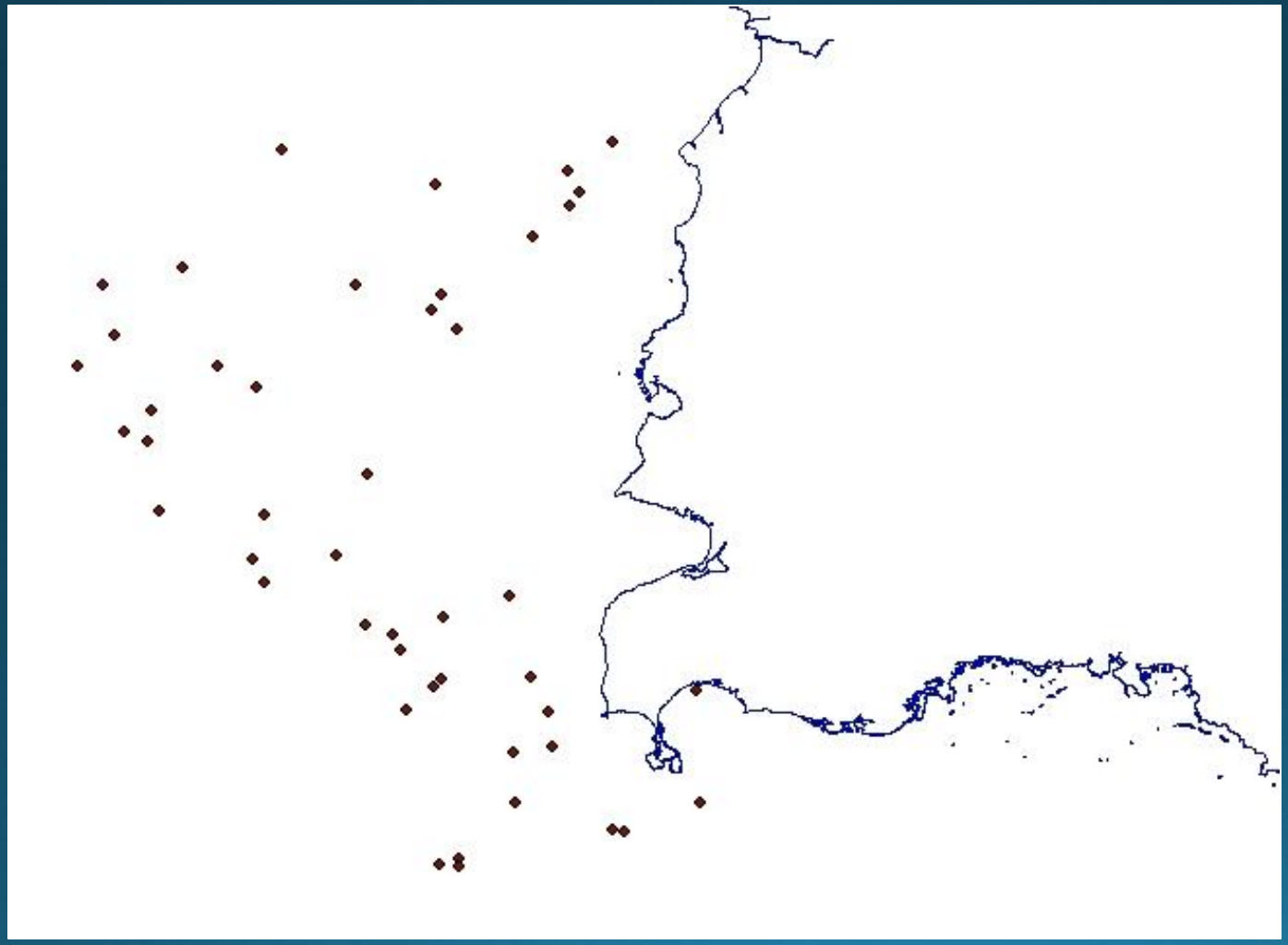
Adult conch

Diver recording data

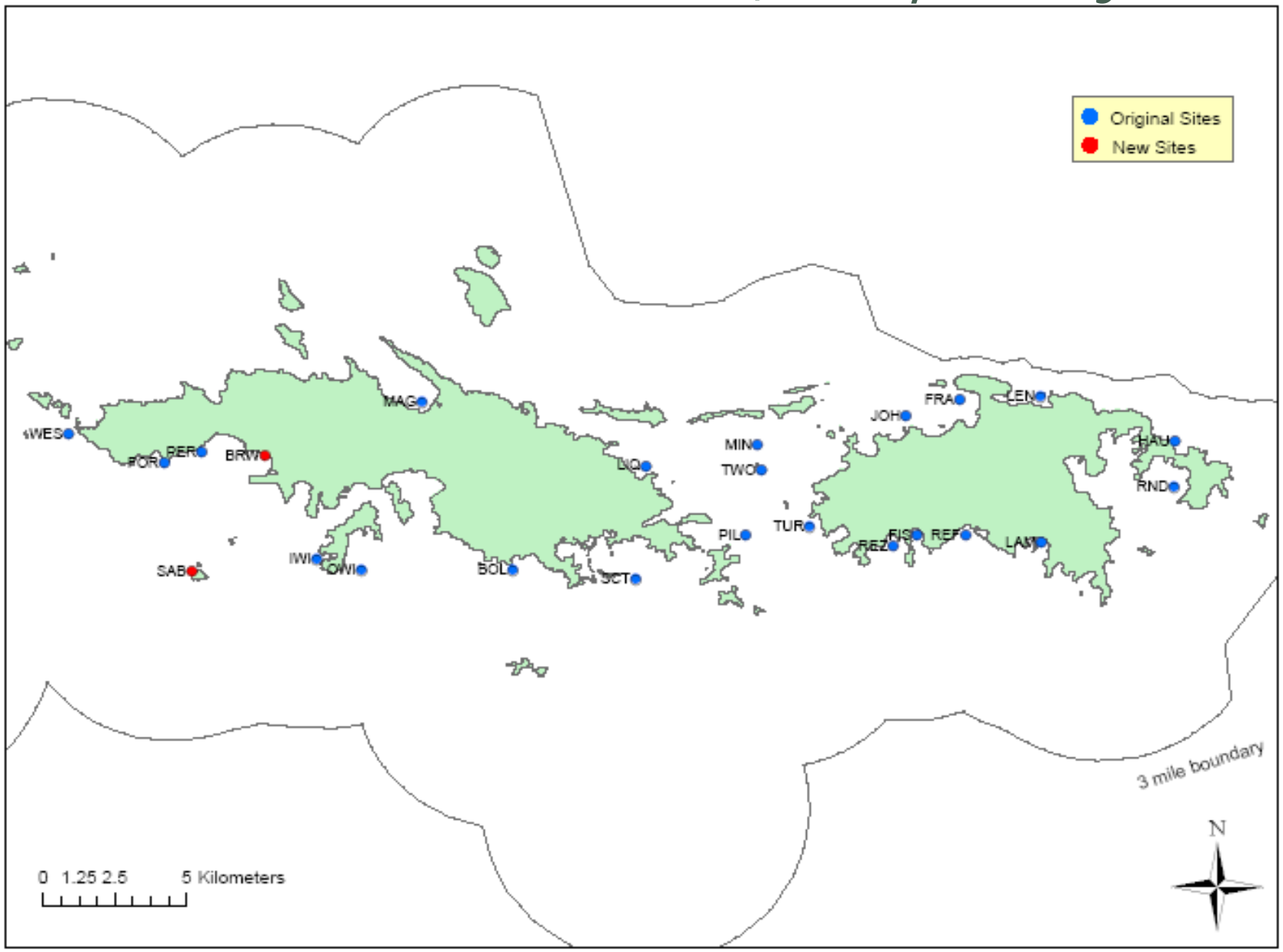
PR Queen conch survey areas



Location of random sample sites for the 2013 conch visual surveys relative to the mainland of Puerto Rico.

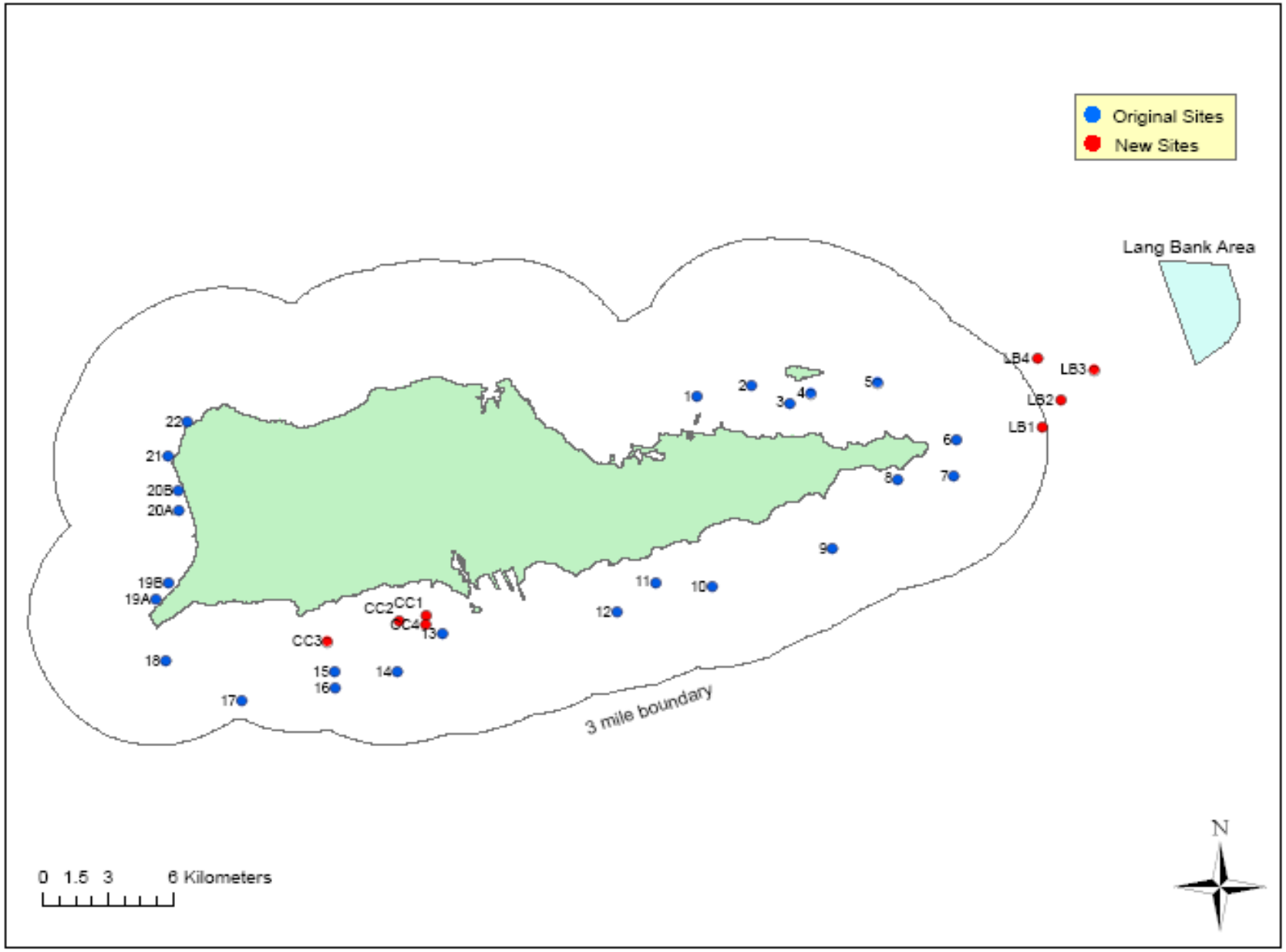


Conch transect sites around St. Thomas/St. John, 2008-2009.



Two new sites were added to the original 22 sites based on fisher input.

Conch transect sites around St. Croix, 2009-2010.



Eight new sites were added to the original 22 based on fisher input and areas of interest such as Lang Bank.

Spiny Lobster Survey

Juvenile Habitat

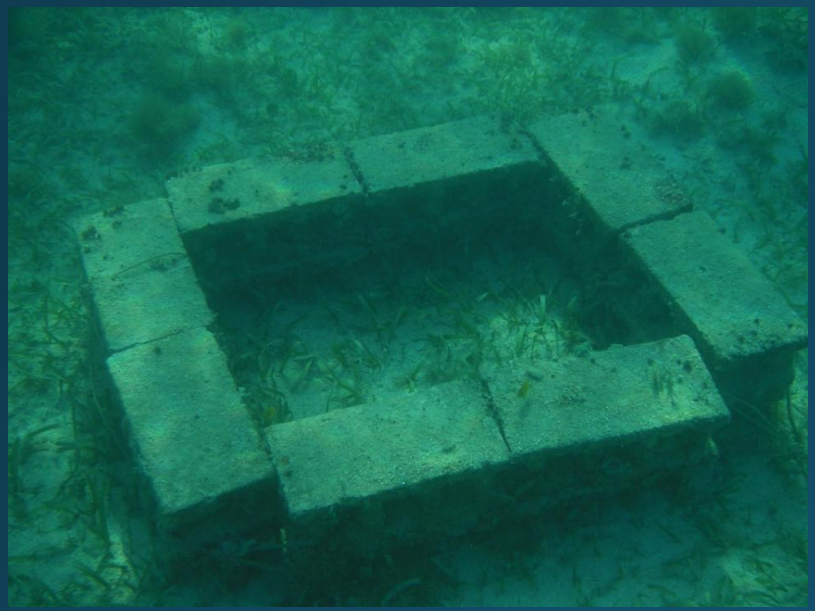
- Six sets of ten juvenile lobster artificial shelters 30 m apart
- built using 16 cement blocks
- Sampling monthly between the full and new moon
- Count the number of juvenile lobsters in the shelter and measured using calibrated stick. Individuals were leaved at the casita
- Casitas were cleaned of overgrowth and octopuses were removed

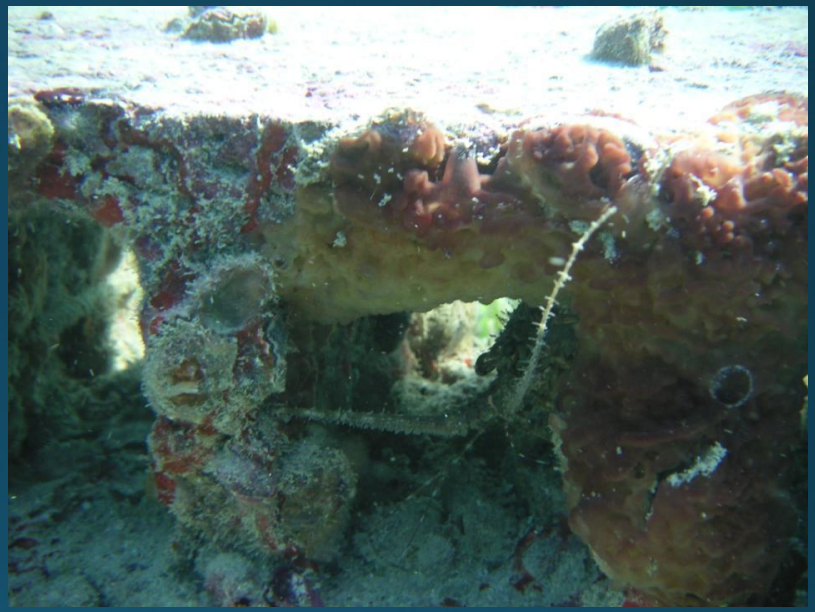
Spiny Lobster Survey

Larvae collectors

- Seven stations along the west coast platform according to depth and distance from the shoreline
- Fifty six modified Witham pueruli collectors
- Two sets of collectors were deployed at each station, 30 m apart from each other
- Each set of 2 collectors hooked to an anchored line, one at a depth range between 30-40 feet and the other at 60-80 feet, 2m above the sea floor.
- Sampling monthly between the new and full moon
- Diver covered the collector with a fine mesh netting (so the pueruli couldn't escape), unsnap the collector and take to the boat
- Collectors were search for spiny lobster pueruli. All pueruli found were counted, classified according to developmental stage (transparent, pigmented and juveniles).

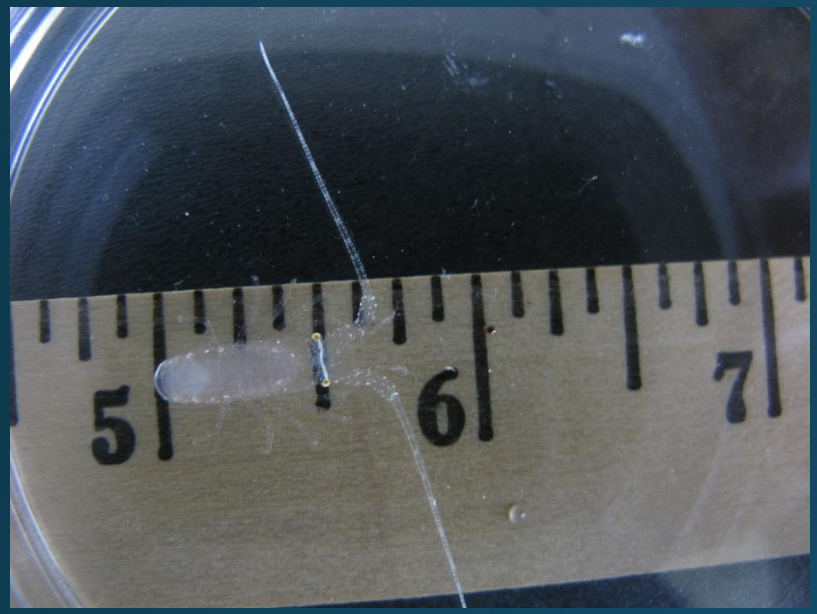
LOBSTER SURVEY “CASITAS”





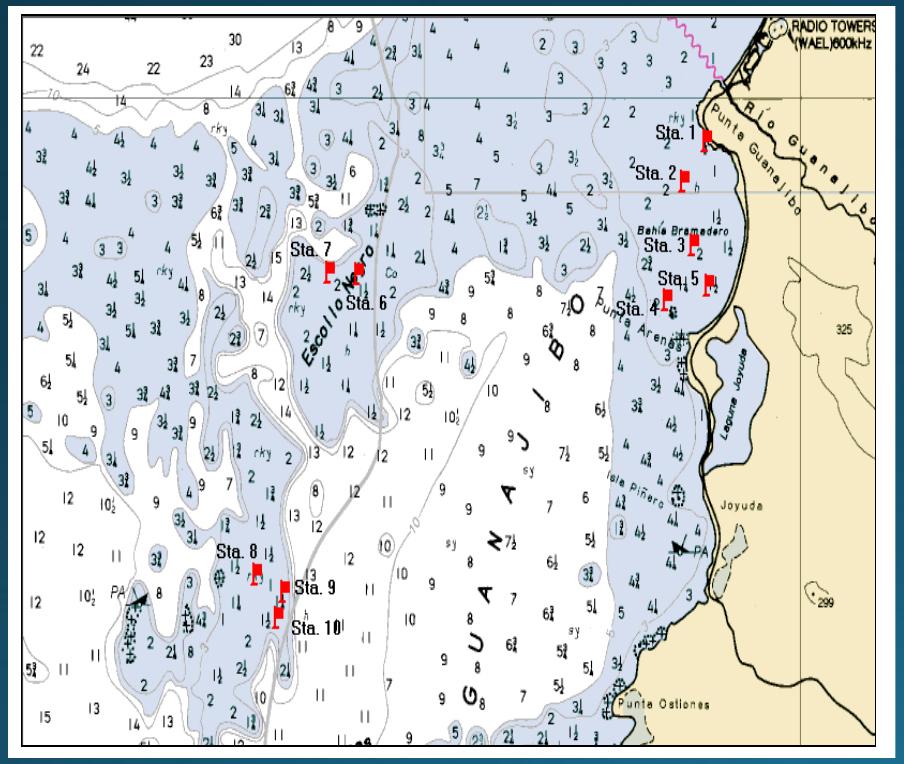
LOBSTER SURVEY “COLLECTORS”

LOBSTER SURVEY “COLLECTORS”

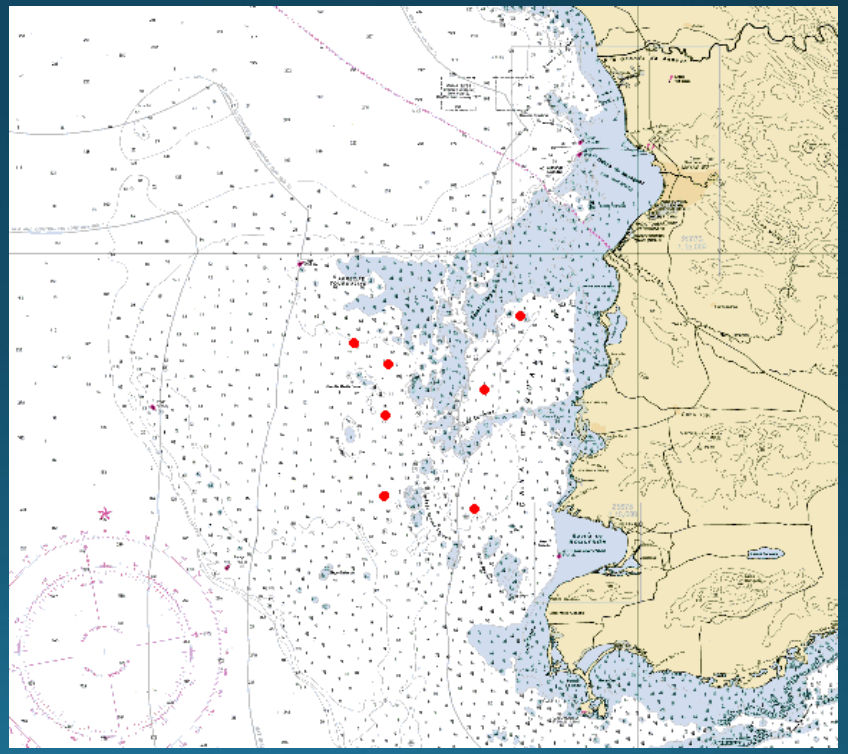


Spiny lobster larvae sampling stations

2003

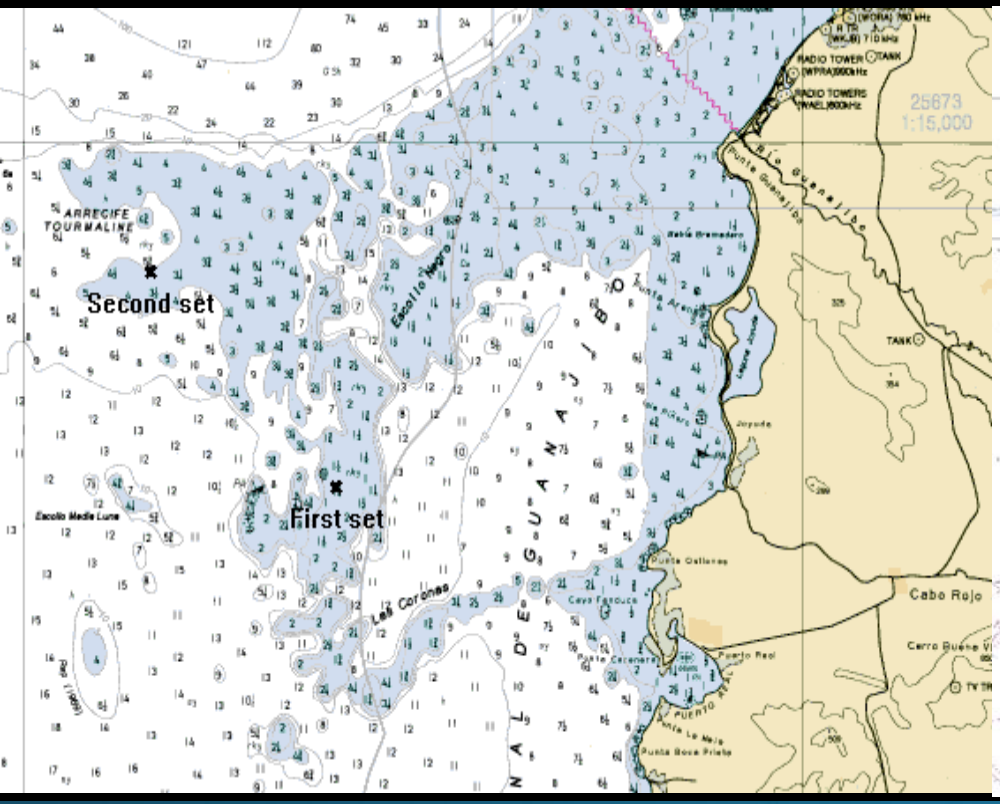


2008

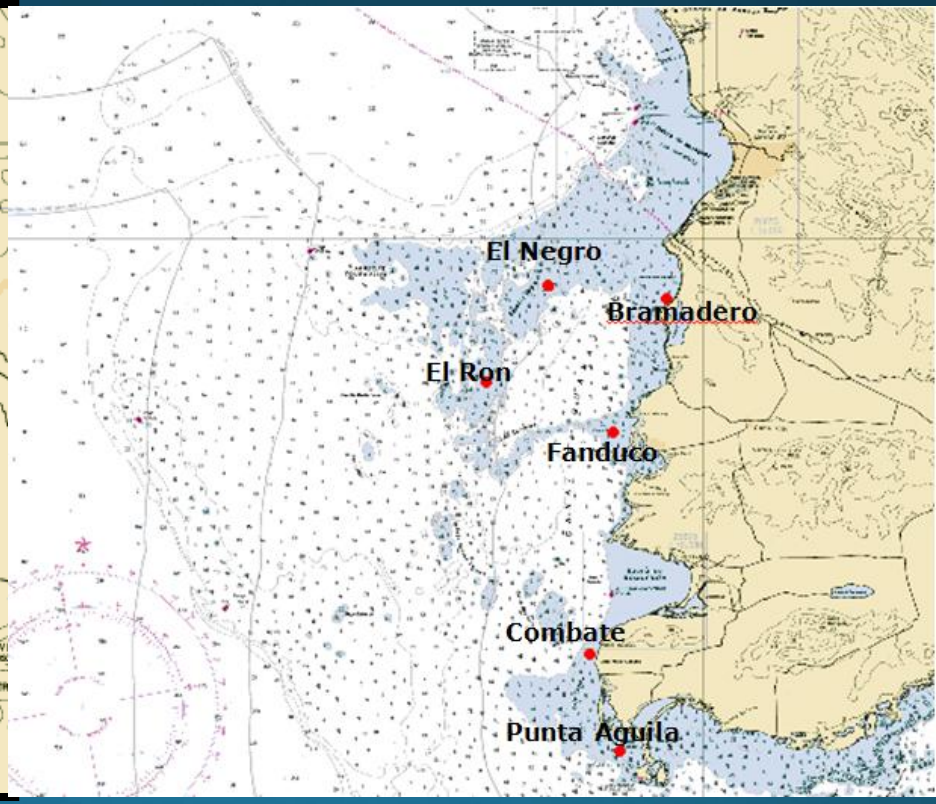


Juvenile lobster survey stations

2003



2007-08



Reef Fish Survey Trap Methodology

- 15 chevron traps – 5 sets of 3 traps
- 2 x 2 nautical miles quadrants located by GPS
- 30 quadrants randomly selected, sampled twice
- Soak time 5 hours
- Bait – tuna gonads (early 90'), sardines
- Catch kept separate identify by trap set and trap id#
- 100' inter trap distance to avoid interference
- Depth less than 50 fathom

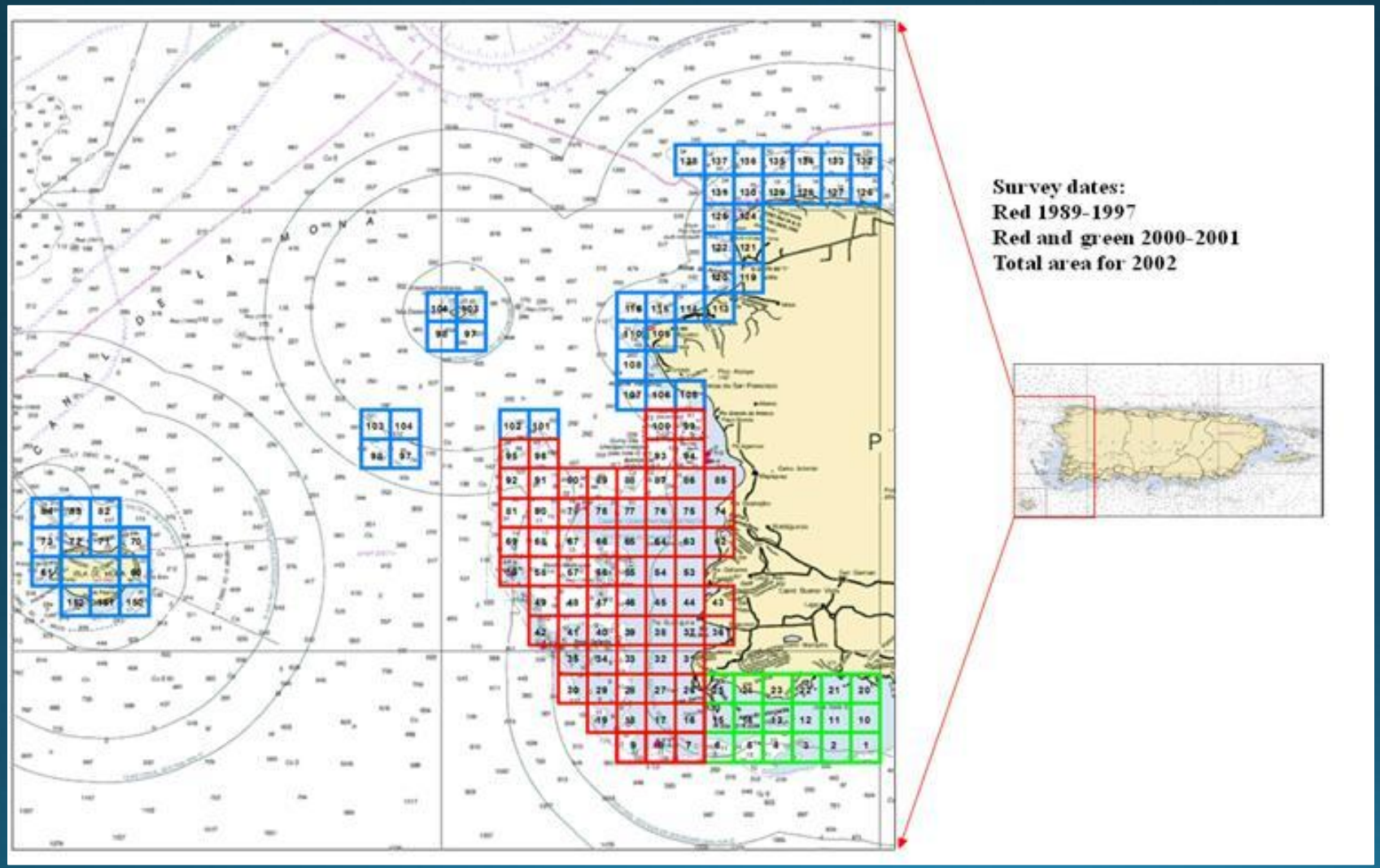
Reef Fish Survey Hook & Line Methodology

- 3 lines (equal to three fishers) with 3 hooks per line
- 4 hours fishing
- Depth less than 50 fathom
- Bait – squid
- Catch kept separate identify by fisher id#
- PR – drift fishing for 15 minutes; USVI anchor fishing, recent surveys drift fishing

Traps

REEF FISH SURVEYS

Survey area in Puerto Rico 2 x 2 nmi for reef fish monitoring from 1989-2002.



Revised SEAMAP Trap Sampling Grid
May 21, 2007

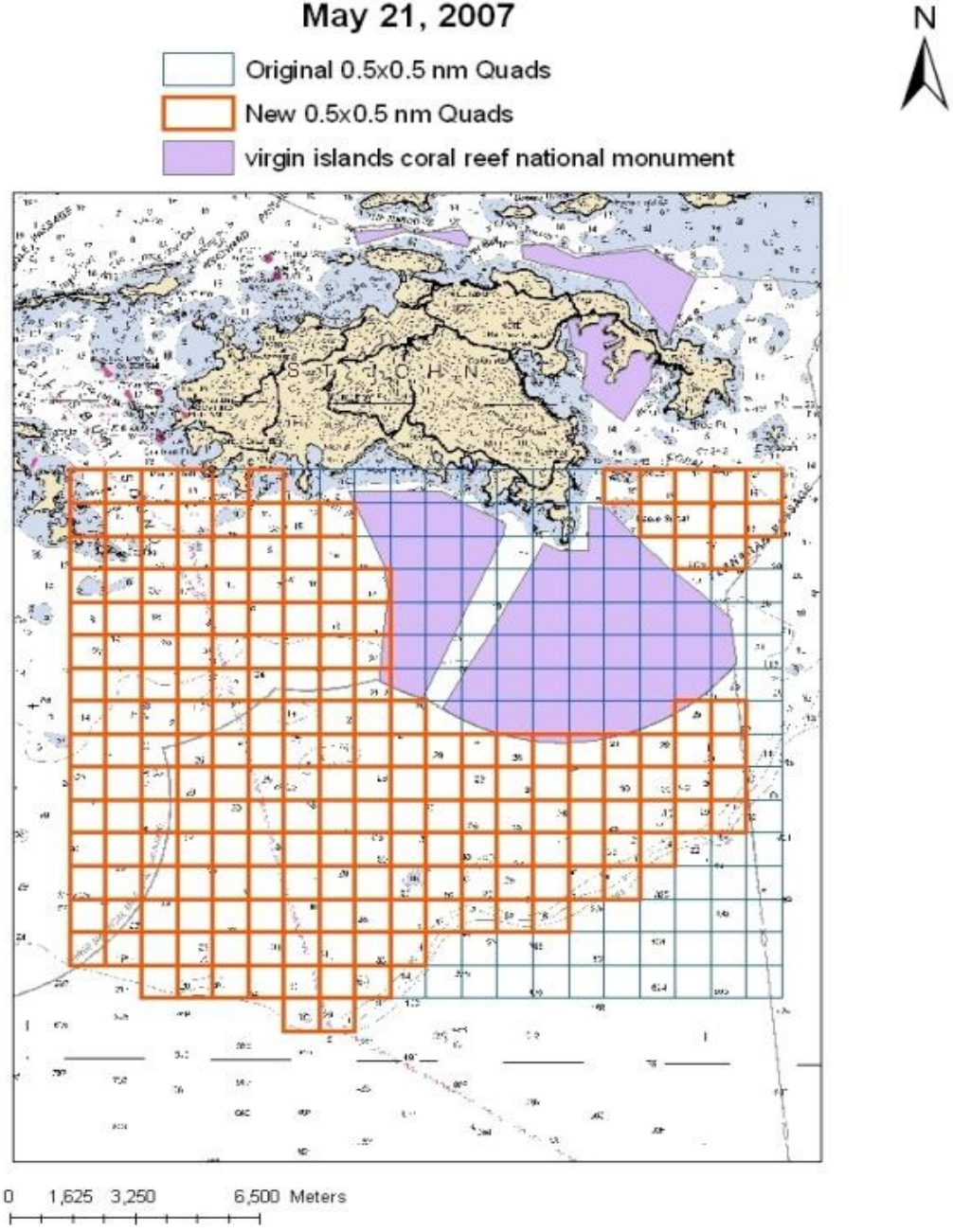
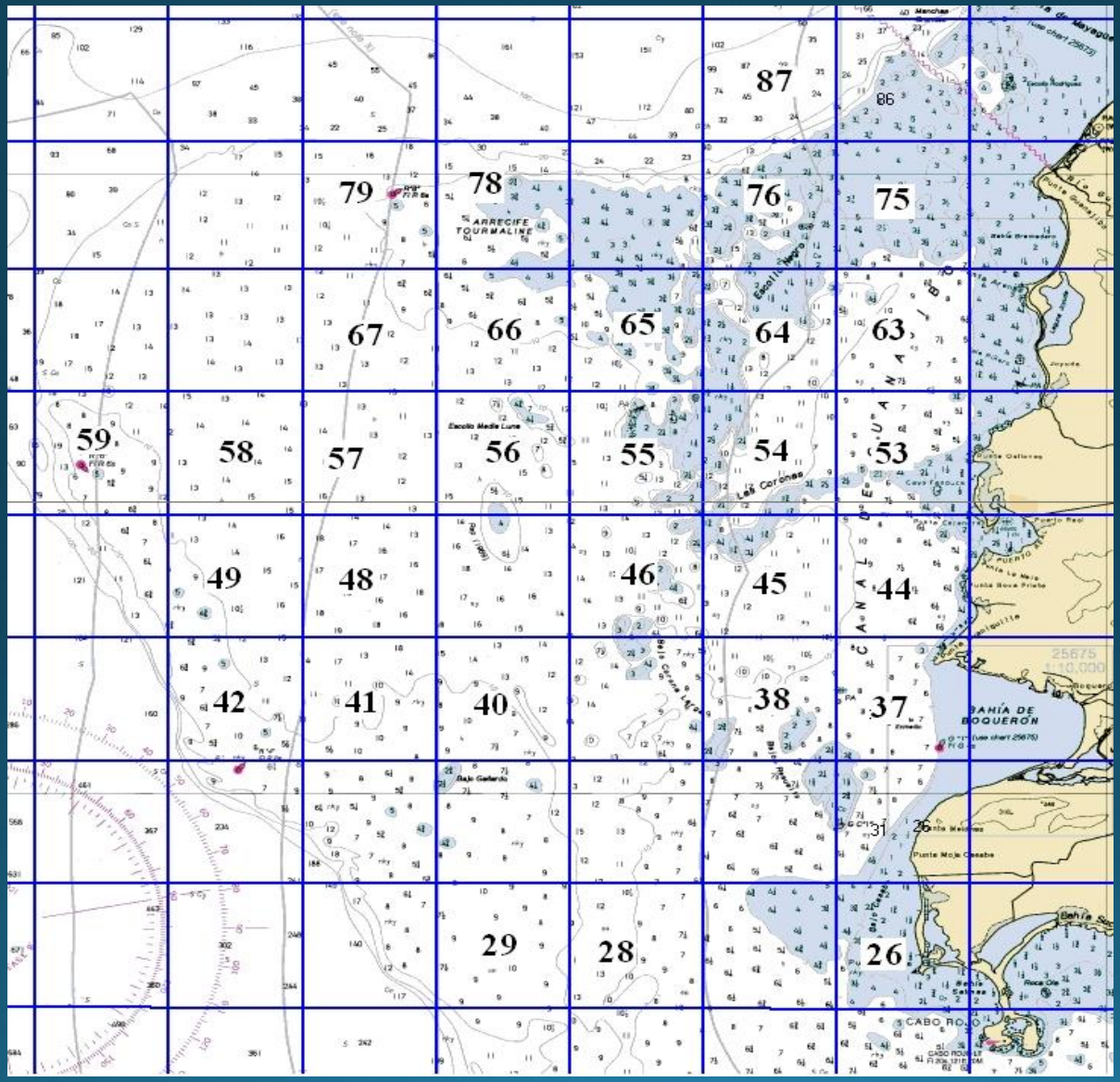
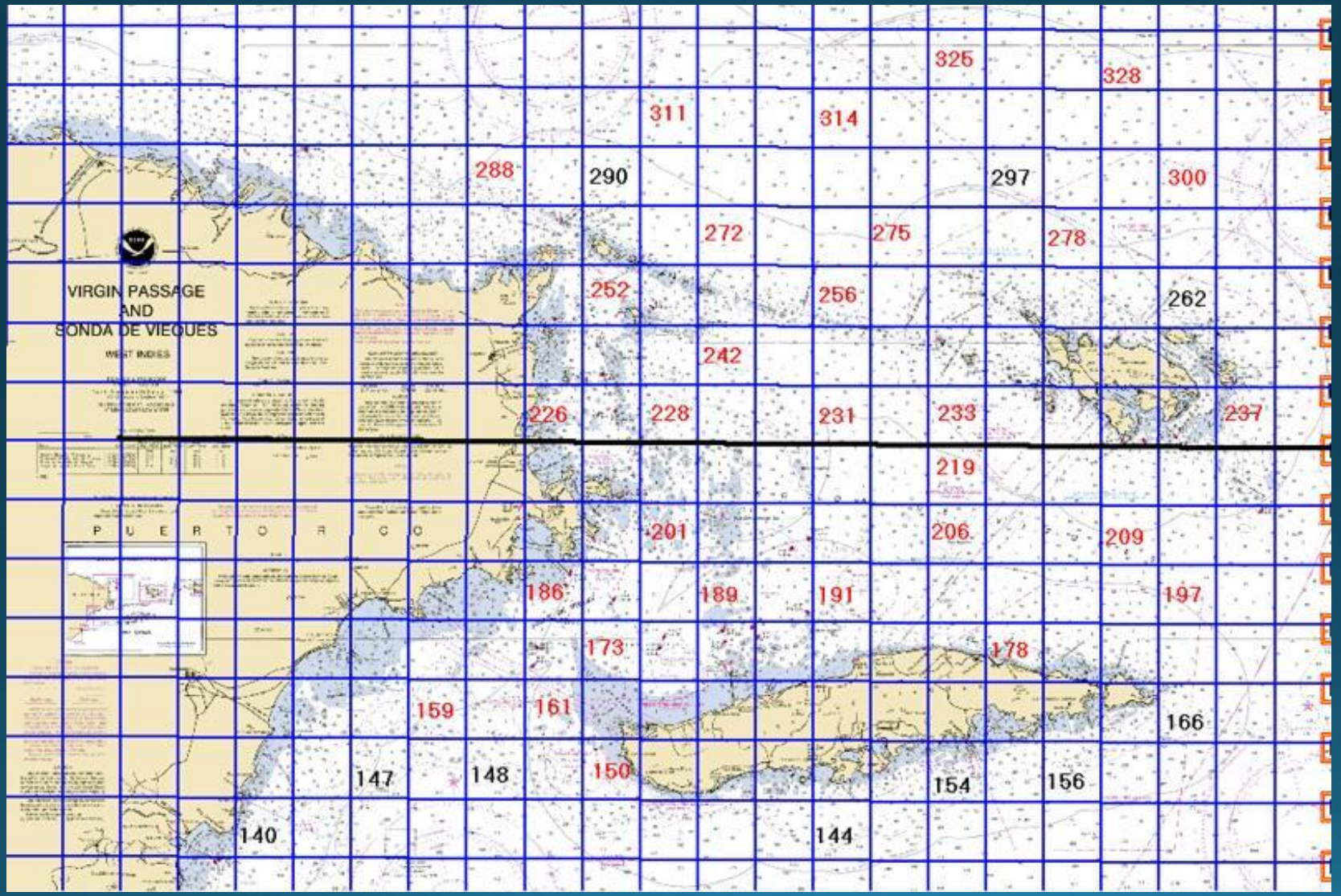


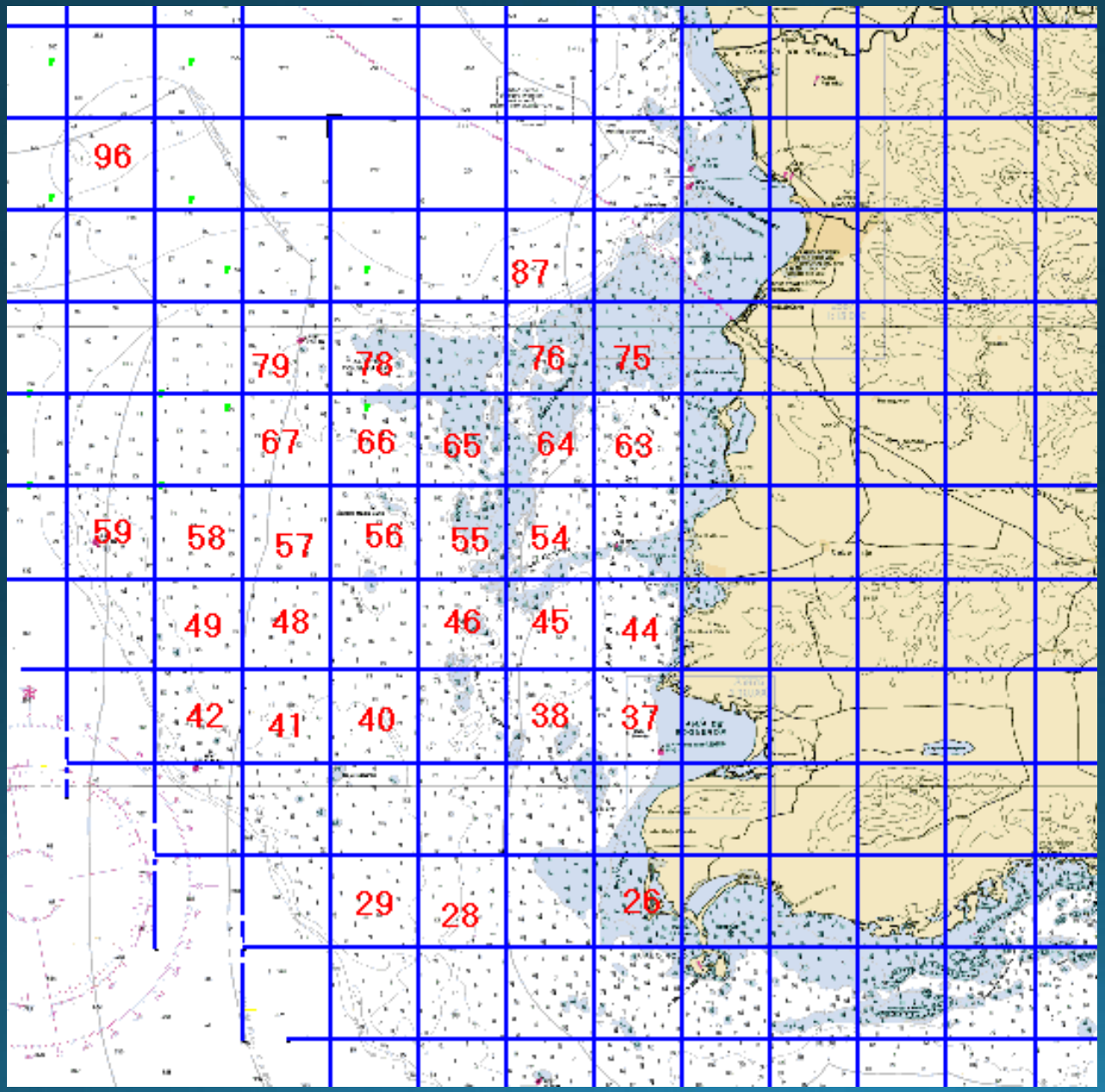
Figure 1. Sampled stations off west coast reef fish survey 2009.



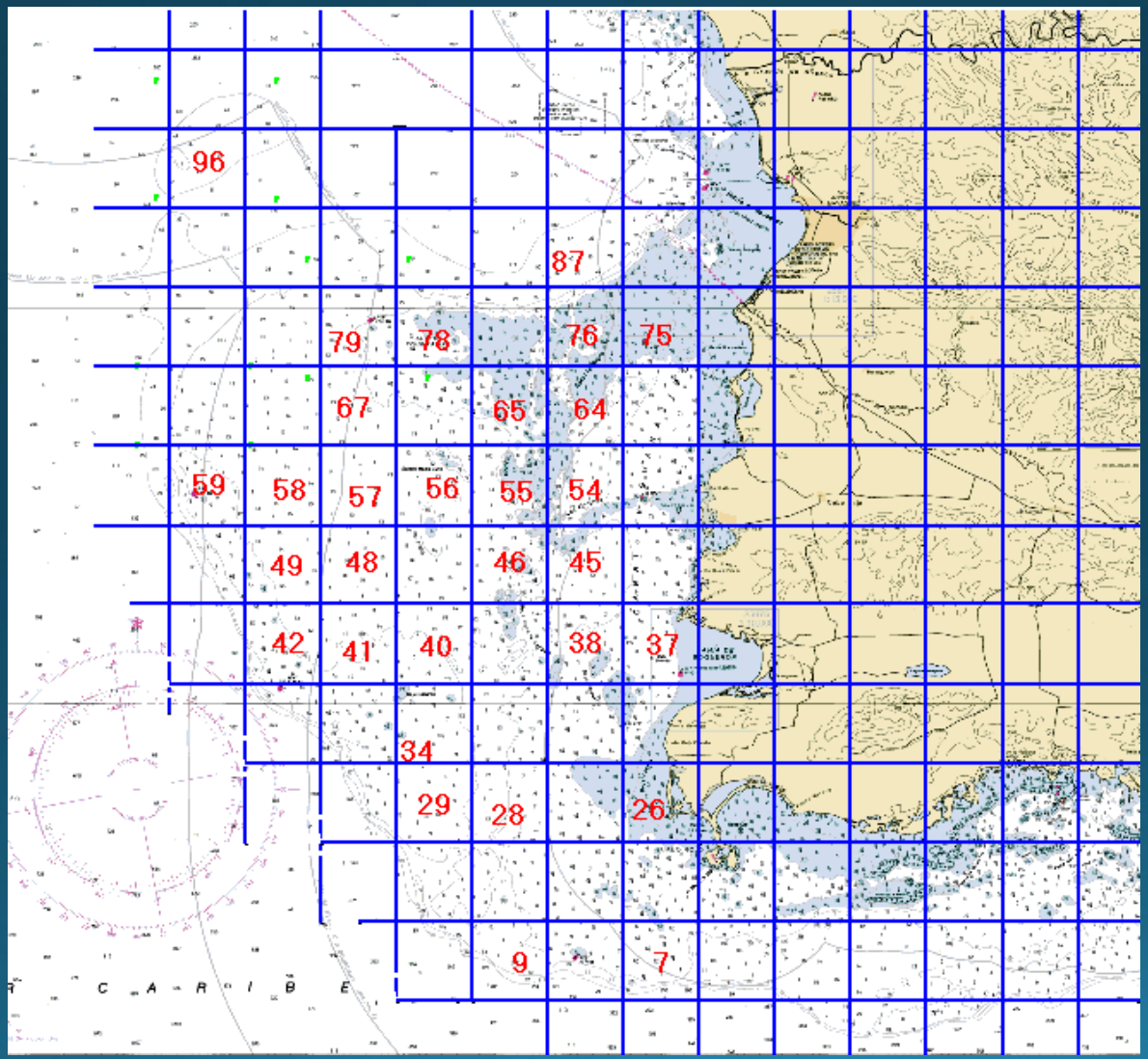
Sampled stations off the east coast of Puerto Rico for reef fish survey 2009-10.



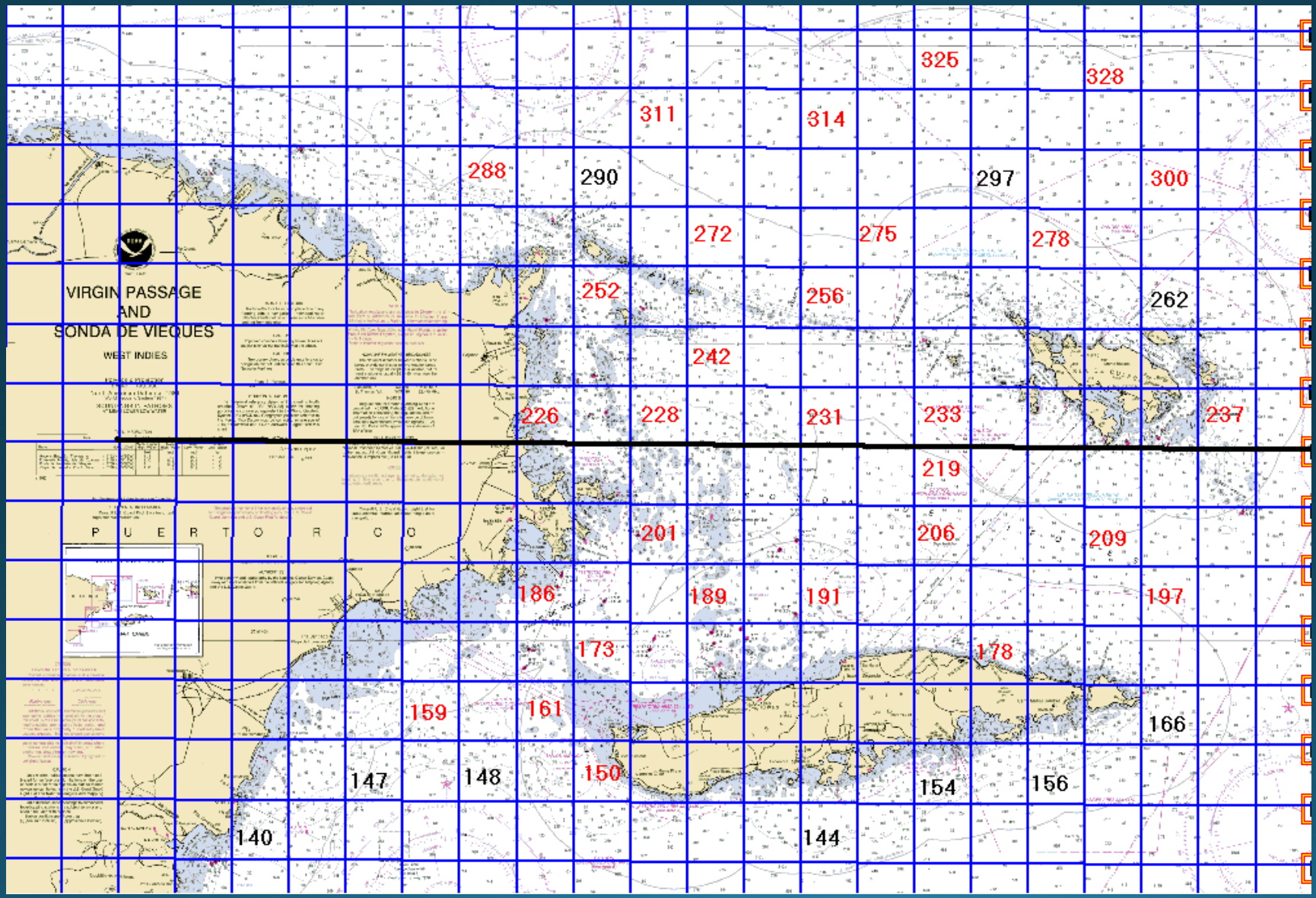
Sampled stations off the west coast of Puerto Rico during 2013.



Sampled stations off the west coast of Puerto Rico during 2014.



Stations sampled during the reef fish survey off the east coast 2013.



PARROT FISH SURVEY USVI

Deep water survey

- Target species blackfin, silk, wenchman and queen snappers
- 4surveys will be conducted monthly off St. Croix and 2 monthly surveys off St. Thomas
- Buoyed vertical set lines retrieved by electric, hydraulic or gear-driven snapper reels
- Each line will have up to 24 circle hooks baited with cut tuna or squid
- Light stick or strobe light will be used above the hooks
- Multiple vertical lines will be fished simultaneously at two depth strata (strata 1 50-100; strata 2 120-250 fathoms)
- Fishing period of 4 to 5 hours.

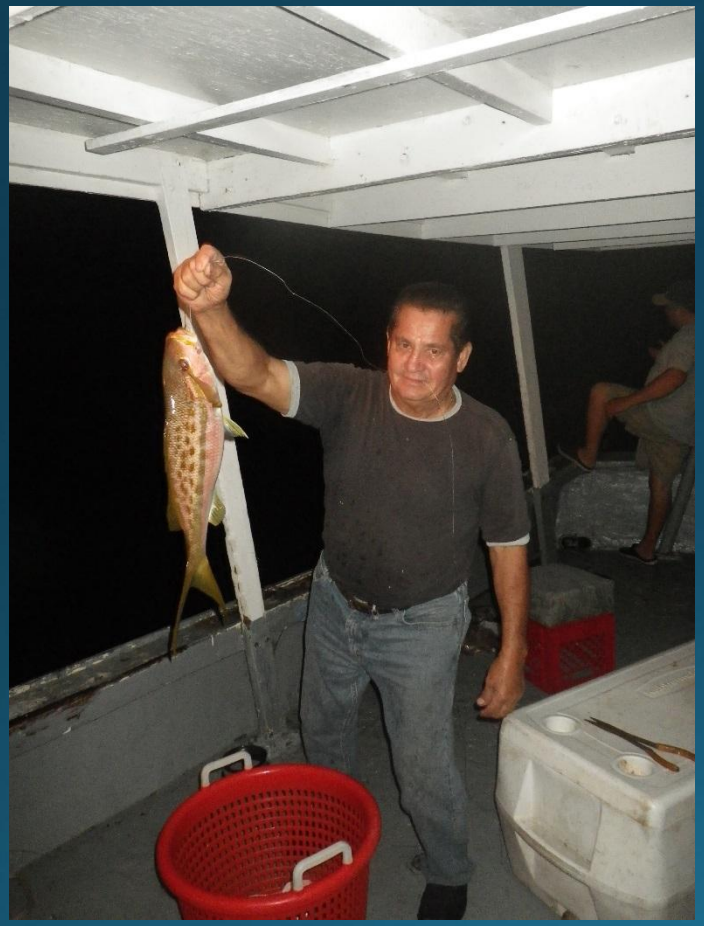
Yellowtail snapper survey

- Stratify the west and east area in fishing sites and non-fishing sites. Select randomly 5 non-fishing sites and 10 (if available) fishing sites
- Sample each area four times, one per season
- Night fishing for two hours using hook and line
- Sardine as bait.
- Three lines, each with three hooks
- Catch per fisher kept separate and identify with fisher ID
- Anchor fishing

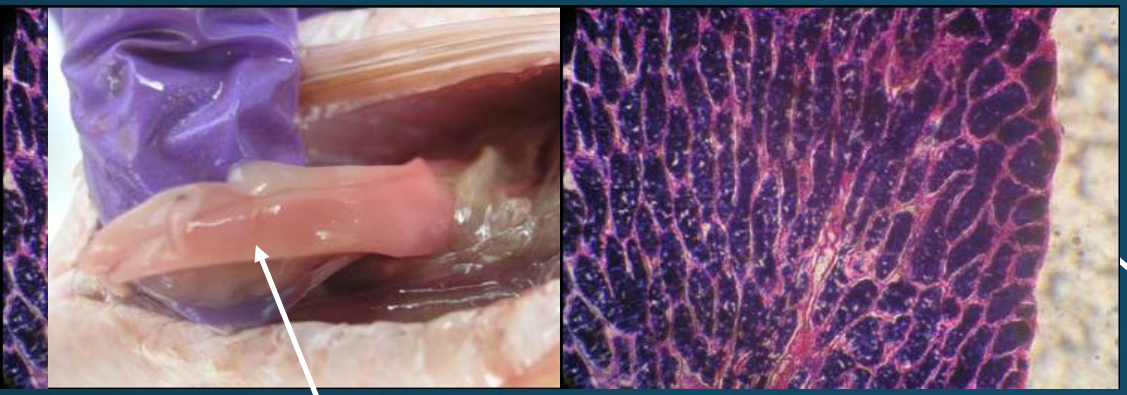
Lane snapper survey

- Stratify the west and east area in fishing sites and non-fishing sites. Select randomly 5 non-fishing sites and 10 (if available) fishing sites
- Sampling will be conducted between 5:30 and 7:30 in the afternoon
- The line soaked for 45 minutes, after which it was lifted and the fish collected. Were deployed three times
- Squid as bait.
- 300 feet #130 line with 18" of a 20 pound fishing line hanging with a #10 hook at the end, every 36"
- Catch per longline kept separate and identify with set ID
- Anchor fishing at both ends with buoys to identify them

Yellowtail Snapper and Lane Snapper Survey



Histology of Yellowtail snapper (*Ocyurus chrysurus*) gonads



Mature testes

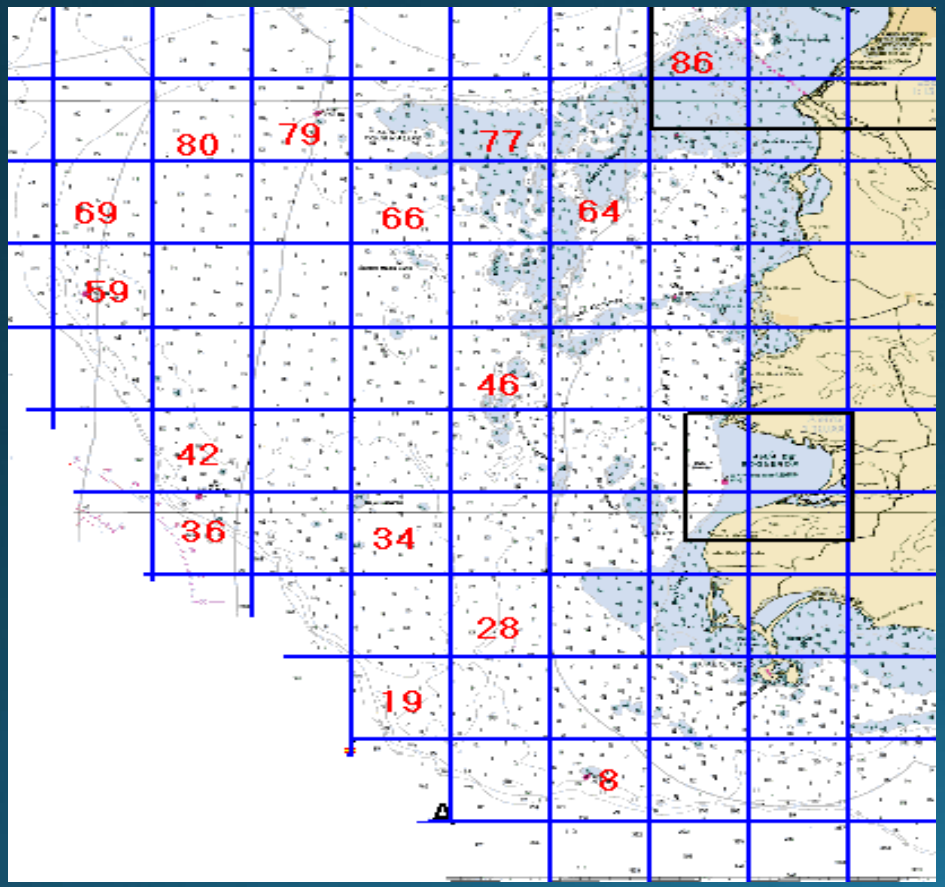
sperm

Mature Ova

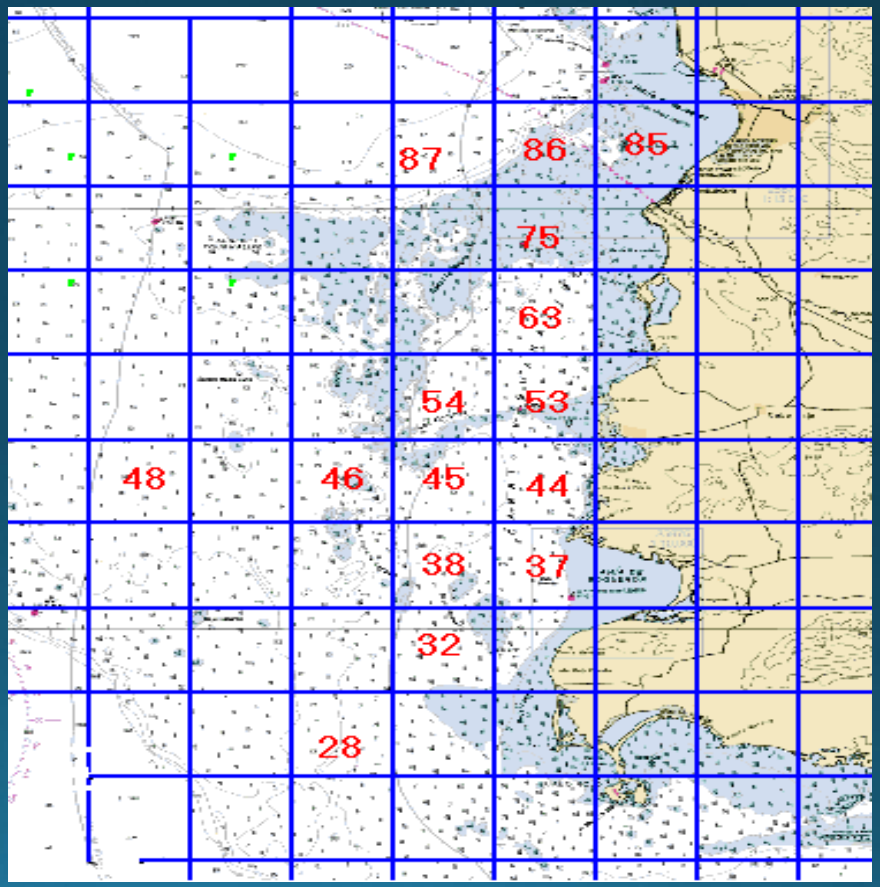
stage 4 Oocyte

Sampled stations off the west coast for: A) yellowtail snapper and B) lane snapper

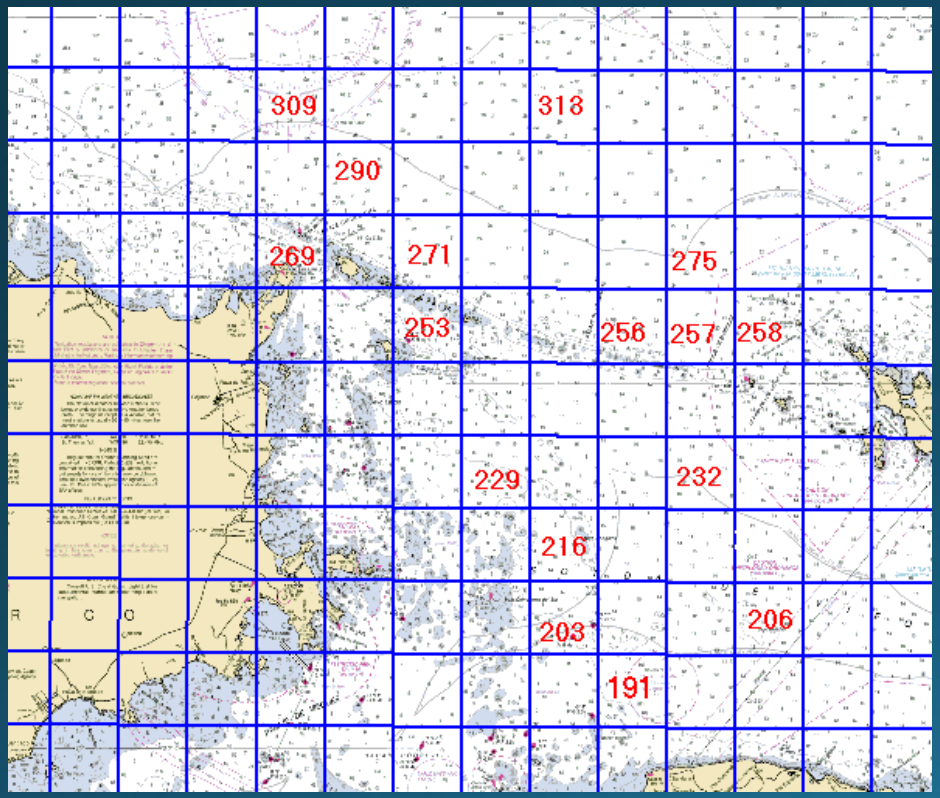
A.

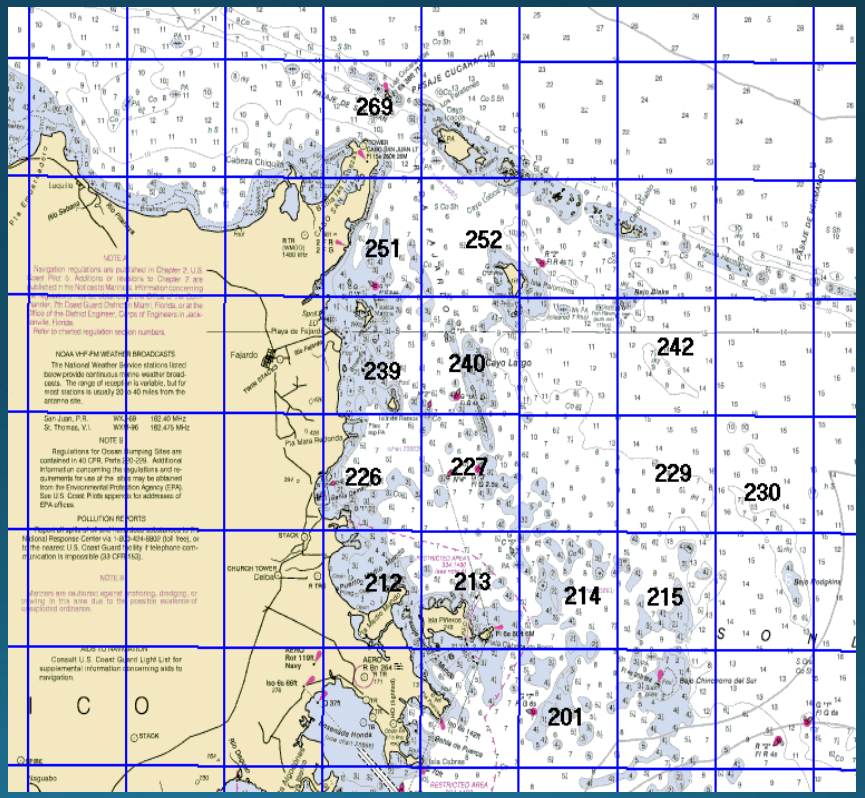


B.



Sampled stations off the east coast for: A) yellowtail snapper and B) lane snapper

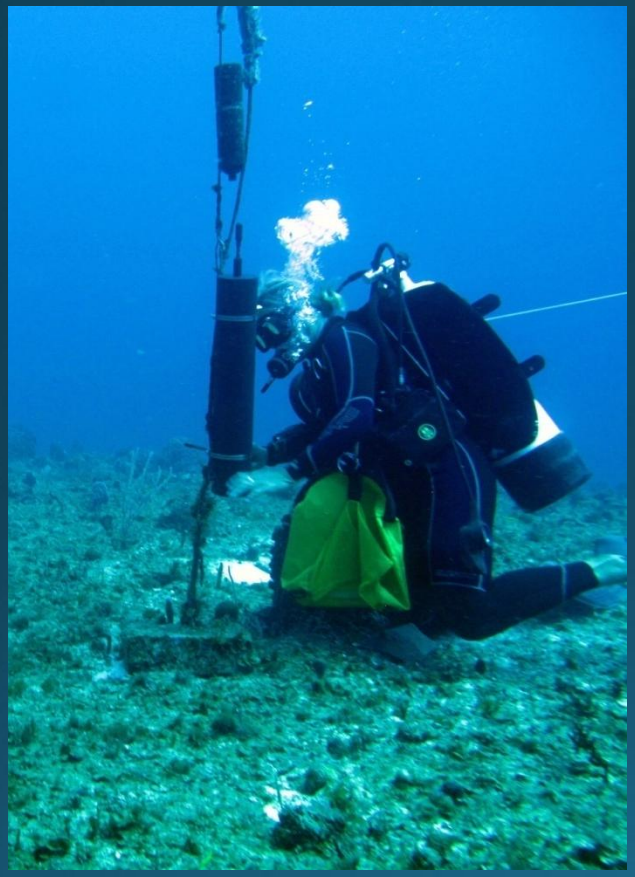




DATALOGGERS

- Examine acoustic recordings and patterns of sound production from grouper spawning aggregation sites in the US Caribbean for the following species during 2011-2012: *Epinephelus guttatus*, *Epinephelus striatus*, *Mycteroperca venenosa*, and potentially *Mycteroperca tigris* and *Mycteroperca bonaci*.
- Levels of sound production and site specific timing of peak and elevated acoustic behaviors and probable spawning were to be determined for each species.
- Useful for species that made sound and aggregate at specific sites, during specific time frames.

Deployment



Red Hind Calls per Hour, 18:00-19:00AST